

WHAT IS CLAIMED:

1 1. A method for determining a first and a second phase of a biphasic defibrillation shock
2 pulse, one of said first phase and said second phase having variable energy, wherein upon
3 application of said first phase and said second phase of said biphasic defibrillation shock pulse a
4 desired response is produced in a patient's cardiac cell membrane, comprising:

5 providing a quantitative model of a defibrillator circuit for producing said
6 biphasic defibrillation shock pulse;

7 providing a quantitative model of a patient that includes a variable heart
8 component;

9 providing a quantitative description of a predetermined response of said cardiac
10 cell membrane to said shock pulse; and

11 determining a quantitative description of a first phase and a second phase of said
12 biphasic defibrillation shock pulse by selecting from a group consisting of items (a) and
13 (b) as defined below:

14 (a) determining a quantitative description of a first phase of said
15 biphasic defibrillation shock pulse that will produce said predetermined response
16 of said cardiac cell membrane, wherein the determination is made as a function of
17 said predetermined response of said cardiac cell membrane, said quantitative
18 model of a defibrillator circuit, and said quantitative model of a patient, and
19 wherein the quantitative description of the first phase provides for setting a time
20 duration for said first phase based on said variable heart component, whereby an

21 amount of energy to be delivered by said first phase varies according to the time
22 duration that is set; and

23 determining a quantitative description of a second phase of said biphasic
24 defibrillation shock pulse phase on said first phase; and

25 (b) determining a quantitative description of a first phase of said
26 biphasic defibrillation shock pulse that will produce said predetermined response
27 of said cardiac cell membrane, wherein the determination is made as a function of
28 said predetermined response of said cardiac cell membrane, said quantitative
29 model of a defibrillator circuit, and said quantitative model of a patient; and

30 determining a quantitative description of a second phase of said biphasic
31 defibrillation shock pulse based on said first phase, wherein said quantitative
32 description provides for setting a time duration for said second phase based on
33 said variable heart component whereby an amount of energy to be delivered by
34 said second phase varies according to said time duration that is set.